

REMARKS

Claims 1-48 were pending in this application when the present Office Action was mailed (November 30, 2004). Claim 6 has been amended to clarify the antecedent basis for an element of the claim, without narrowing the scope of the claim. The amendment to claim 6 is not one that necessitates a new search and accordingly, a subsequent rejection of the pending claims on new grounds should not be made final. None of the remaining claims have been amended.

In the November 30, 2004 Office Action, claims 26-40 were allowed, claims 10, 11, 17 and 42 were objected to, and the remaining claims were rejected. More specifically, the status of the application in light of this Office Action is as follows:

(A) Claim 6 stands rejected under 35 U.S.C. § 112 as lacking proper antecedent basis;

(B) Claims 1-9, 12-16, 18-25, 41 and 43-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,726,534 to Bogush et al. ("Bogush") in light of U.S. Patent No. 6,635,556 to Herner et al. ("Herner"); and

(C) Claims 26-40 are allowed with claims 10, 11, 17 and 42 indicated to be allowable if rewritten to be in independent form.

The undersigned attorney wishes to thank the Examiner and her supervisor for engaging in a telephone interview on March 9, 2005. During the telephone interview, pending claim 1 and the applied references were discussed. The following remarks summarize and expand upon the points raised by the undersigned attorney during the March 9 telephone interview.

A. **Response to the Section 112 Rejection**

Claim 6 has been amended to clarify the antecedent basis of the term "doped polysilicon." Accordingly, the Section 112 rejection of claim 6 should be withdrawn.

B. Response to the Section 103 Rejections

Claims 1-9, 12-16, 18-25, 41 and 43-48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bogush in view of Herner. For the reasons discussed below, these references when combined fail to disclose or suggest all the features of the pending claims, and therefore fail to establish a *prima facie* case of obviousness under Section 103. Accordingly, the Section 103 rejections of these claims should be withdrawn.

Claim 1 is directed to a method for removing material from a microfeature workpiece and includes contacting a polishing pad material with a portion of the workpiece having a doped silicon material. The method further includes disposing a surfactant-containing polishing liquid between the doped silicon material and the polishing pad material. At least one of the microfeature workpiece and the polishing pad material is moved relative to the other while the workpiece contacts the polishing pad material and the polishing liquid. The method further includes uniformly and simultaneously removing at least some of the doped silicon material from regions of the workpiece having different crystalinities and/or differing doping characteristics, by contacting the doped silicon material with the surfactant and the polishing liquid as at least one of the workpiece and the polishing pad material moves relative to the other. Accordingly, methods having the features of claim 1 can be used to efficiently and uniformly remove material that may have varying dopant and/or crystalinity characteristics.

Bogush discloses generally the use of polishing liquids to remove material from a substrate. Bogush discloses a wide array of substrates, including substrates that comprise a doped silicon oxide. Bogush also discloses a wide array of polishing liquids, including those that contain surfactants. The main thrust of Bogush's disclosure is directed to a process for mixing components of the polishing liquid at or very near the point-of-use of the polishing system (Bogush at column 2, lines 42-44).

Herner discloses a method for "capping" doped silicon layers to prevent outgassing of the dopants underneath the cap. (Herner at column 2, lines 42-51). Accordingly, Herner discloses multiple doped silicon layers 122, 126 separated by a

capping layer 124 (see Figure 1D and discussion at column 4, lines 49-52). The undoped silicon capping layer can be removed to leave behind a doped silicon film. (Herner at column 6, lines 56-59).

The Office Action alleges that it would have been obvious to apply Bogush's disclosure of polishing liquids to remove material having different crystalinities and/or dopant concentrations as disclosed by Herner. However, this is not in fact the case. For example, Bogush discloses (separately) a surfactant and doped silicon material, but does not explicitly disclose the combination of surfactant-containing polishing liquids to remove doped silicon materials from a semiconductor substrate. However, even assuming for the sake of argument that Bogush does explicitly disclose using a surfactant-containing polishing liquid to remove a doped silicon material, Bogush fails to disclose or suggest "uniformly and simultaneously removing the . . . doped silicon material from regions of [a] microfeature workpiece having different crystalinities and/or different doping characteristics," as recited in claim 1. Herner fails to fill this void in Bogush's disclosure. In particular, Herner discloses materials having different doping characteristics stacked one above the other and separated by an undoped capping layer. Herner fails to disclose or suggest any means by which such layers could be removed "uniformly and simultaneously." Herner does disclose using a CMP process to remove material layers (see Herner at column 6, line 30), but at best, this method would tend to remove Herner's stacked layers in a sequential fashion, not a simultaneous fashion. Accordingly, the Section 103 rejection of claim 1 should be withdrawn.

Claims 2-9, 12-16 and 18-25 all depend from claim 1. Accordingly, the Section 103 rejections of these claims should be withdrawn for the reasons discussed above and for the additional features of these dependent claims.

Claim 41 is directed to a method for removing material from a microfeature workpiece having a doped silicon material, and includes forming defects in the doped silicon material by disposing a first polishing liquid adjacent to the doped silicon material and removing the first portion of the doped silicon material by chemical-mechanical planarization. The method can further include disposing a second polishing liquid

adjacent to the doped silicon material and removing a second portion of the doped silicon material and the defects by chemical-mechanical planarization, wherein the second polishing liquid has a different composition than the first polishing liquid.

Neither of the applied references discloses "forming defects in the doped silicon material . . . by disposing a first polishing liquid adjacent to the doped silicon material, "removing a first portion of the doped silicon material by chemical-mechanical planarization," and "removing a second portion of the doped silicon material and the defects by chemical-mechanical planarization." This is so for at least the reason that neither of the applied references appears to disclose "forming defects in the doped silicon material." Accordingly, the Section 103 rejection of claim 41 should be withdrawn.

Claims 43-48 depend from claim 41. Accordingly, the Section 103 rejections of these claims should be withdrawn for the foregoing reasons and for the additional features of these dependent claims.

C. Response to the Indication of Allowable Subject Matter

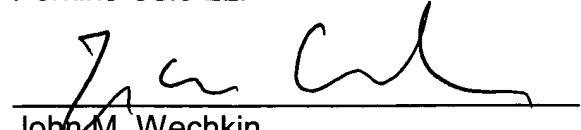
The allowed and allowable claims have not been amended in this response.

D. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (206) 359-3257.

Respectfully submitted,

Perkins Coie LLP

A handwritten signature in black ink, appearing to read "John M. Wechkin", is written over a horizontal line.

John M. Wechkin

Registration No. 42,216

Date: March 21, 2005

Correspondence Address:

Customer No. 25096

Perkins Coie LLP

P.O. Box 1247

Seattle, Washington 98111-1247

(206) 359-8000